

REMARKS

Claims 1 and 7-10 are amended, and claims 1-9 are pending in the application.

Claim 1, from which claims 2-9 depend, stands rejected over Andricacos (U.S. Patent 6,224,690); Schrock (U.S. Patent 6,221,691) or Hara (U.S. Patent 6,433,390). Applicant has amended claim 1, and respectfully requests reconsideration of such rejections.

Amended claim 1 recites a semiconductor package comprising a solder having an alpha flux of less than $0.0005 \text{ cts/cm}^2/\text{hr}$. The amendment to claim 1 is supported by the originally-filed application at, for example, paragraph 0017 on page 5, and therefore does not comprise "new matter".

Not one of the Examiner's cited references discloses a solder having an alpha flux of less than $0.0005 \text{ cts/cm}^2/\text{hr}$. Rather, the references merely indicate that solders can be utilized in semiconductor packaging, without providing any discussion of the alpha flux present in such solders.

The Examiner appears to be concluding that since the references do not specifically indicate the alpha fluxes of the solders described therein, it is reasonable that the solders can have any alpha fluxes that the Examiner deems appropriate, and specifically that the solders can have the low alpha flux recited in claim 1.

Applicant respectfully submits that such is not a reasonable conclusion. Rather, as described in applicant's specification at, for example, paragraphs 0013-0015 and 0038, commercially-available solders (including so-called lead-free solders) suffer from alpha particle emission. An aspect of the invention is a recognition that the alpha particle

emission present in the solders can be due to contaminating materials other than lead (see, for example, paragraphs 0030 and 0038 of the specification). Thus, the Examiner's conclusion that the solder materials described in the prior art references would have low alpha counts is not a valid conclusion, even for those materials (such as the materials of Andricacos) which are so-called lead-free materials. For at least this reason, the Examiner's contention that the references disclose or suggest the subject matter of claim 1, in spite of there being no any specific teaching in the references that their solders have the claim 1 recited low alpha counts, is mistaken. Rather, such contention of the Examiner is a supposition which is not supported by the prior art.

For the above-discussed reasons, the cited references do not suggest or disclose the subject matter of claim 1. Accordingly, applicant requests formal allowance of claim 1 in the Examiner's next action.

Claims 2-9 depend from claim 1, and are therefore allowable for at least the reasons discussed above regarding claim 1, as well as for their own recited features which are neither shown or suggested by the cited art. For instance, claim 6 recites a solder that is at least 99 weight% lead, and yet which has the low alpha flux recited in claim 1. Lead-containing solders are notorious for having high alpha fluxes.

The Examiner cites Hara against claim 6, and concludes that Hara's teaching of a lead-containing solder in a semiconductor device suggests the subject matter of claim 6. The Examiner reaches such conclusion even though Hara is silent regarding the alpha flux of the lead-containing solder disclosed therein.


Applicant respectfully submits that it is inappropriate for the Examiner to assume that Hara's silence necessarily implies that the lead-containing solder disclosed in Hara would have an ultra low alpha flux of the type recited in claim 1. Rather, applicant respectfully submits that Hara's silence indicates that Hara is utilizing conventional lead-containing solder. Specifically, Hara's silence regarding the alpha flux of the lead-containing solder utilized therein implies that such lead-containing solder was not "special", but instead is the standard commercially-available lead-containing solder.

Applicant's invention was motivated, at least in part, due to the industry desire to reduce the alpha flux of commercially-available solders. Hara does not disclose or suggest anything regarding the solder utilized therein which would indicate that such solder had an alpha flux below that of typical commercially-available solders. It is inappropriate for the Examiner to infer that the lead-containing solder of Hara had a substantially lower alpha flux than typical commercially-available solders, when nothing in the reference suggests such "special" property of the solder utilized therein. Accordingly, the Examiner's rejection of claim 6 as being suggested by Hara is inappropriate, and applicant therefore requests withdrawal of such rejection in the Examiner's next action. As such is the only rejection pending against claim 6, applicant respectfully requests allowance of claim 6 in the Examiner's next action.

Claims 1-9 are allowable for the reasons discussed above. Applicant therefore requests that the Examiner's next action be a Notice of Allowance formally allowing claims 1-9.

Respectfully submitted,

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